ABSTRACT OF THE DISCLOSURE

A diffractive optics system for wavelength division multiplexing and demultiplexing optical signals. The present system can be employed in multiplexers, demultiplexers, spectrum analyzers, and the like. In one embodiment, the diffractive optics system includes a waveguide array, a lens assembly, first and second diffractive optical elements ("DOEs"), and a reflector. In a demultiplexing operation, a multiplexed optical signal is input into the system via an input waveguide in the waveguide array. The signal is focused by the lens assembly, then transmitted through the first and second DOEs, where diffraction of the signal and separation of its constituent wavelength-distinct channels occurs. The channels are then reflected by the reflector back through the first and second DOEs, after which each channel is directed by the lens assembly to one of a plurality of output waveguides located in the waveguide array. A conversely similar process is followed for producing a multiplexed optical signal.

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